access (TDMA) and frequency division multiple access (FDMA). In addition the communication channel could alternatively be an electronic data bus, wireline, optical fiber link, satellite link, or any other type of communication channel.

What is claimed is:

1. A communication unit comprising:

(a) reference means for inserting reference symbols into a stream of input data symbols to form a reference coded stream of input data symbols; and

(b) spreading means, operatively coupled to the reference means, for preparing the reference coded stream of input data symbols for transmission over a communication channel by spreading the reference coded stream of input data symbols with a spreading code prior to transmission over the communication channel.

2. The communication unit of claim 1 wherein the reference means inserts reference symbols into a stream of input data symbols according to an insertion algorithm to form a reference coded stream of input data symbols, the insertion algorithm comprising inserting reference symbols at a rate greater than twice of channel variation frequency of a communication channel over which the reference coded stream of input data symbols is to be transmitted.

3. The communication unit of claim 1 wherein the spreading means comprises first spreading means for spreading the reference symbols with a first spreading code and second spreading means for spreading the stream of input data symbols with a second spreading code.

4. The communication unit of claim 3 wherein the first spreading code is substantially similar to the second spreading code.

5. The communication unit of claim 3 wherein the first spreading code is substantially different from the second spreading code.

6. The communication unit of claim 1 wherein the spreading means comprises first spreading means for spreading the reference symbols at a first rate of spreading and second spreading means for spreading the stream of input data symbols at a second rate of spreading.

7. The communication unit of claim 6 wherein the first rate of spreading is substantially similar to the second rate of spreading.

8. The communication unit of claim 6 wherein the first rate of spreading is substantially different from the second rate of spreading.

9. The communication unit of claim 1 further comprising a transmitting means, operatively coupled to the spreading means, for transmitting the spread reference coded stream of input data symbols over the communication channel.

10. The communication unit of claim 9 wherein the communication channel is selected from the group consisting of an electronic data bus, radio communication link, wireline, optical fiber link, and satellite link.

11. A communication unit comprising:

(a) demodulating means for despreading a received communication signal with a spreading code to derive a stream of reference samples and a stream of data samples;

(b) channel estimation means, operatively coupled to the extracting means, for estimating the channel response by utilizing the stream of reference samples; and

(c) detection means, operatively coupled to the extracting means and the channel estimation means, for generating an estimated data symbol from the stream of data samples by utilizing the estimated channel response.

12. The communication unit of claim 11 wherein the demodulating means comprises first despreading means for despreading the received communication signal with a first despreading code to derive the stream of reference samples and second despreading means for despreading the received communication signal with a second despreading code to derive the stream of data samples.

13. The communication unit of claim 12 wherein the first despreading code is substantially similar to the second despreading code.

14. The communication unit of claim 12 wherein the first despreading code is substantially different from the second despreading code.

15. The communication unit of claim 11 wherein the demodulating means comprises first despreading means for despreading the received communication signal at a first rate of despreading to derive the stream of reference samples and second despreading means for despreading the received communication signal at a second rate of despreading to derive the stream of data samples.

16. The communication unit of claim 15 wherein the first rate of despreading is substantially similar to the second rate of despreading.

17. The communication unit of claim 15 wherein the first rate of despreading is substantially different from the second rate of despreading.

18. The communication unit of claim 11 wherein the channel estimation means comprises means for estimating the channel response by low-pass filtering the stream of reference samples.

19. The communication unit of claim 11 wherein the channel estimation means comprises means for estimating the channel response as a linear function of sampling time.

20. The communication unit of claim 11 wherein the channel estimation means comprises:

(a) filtering means for generating an estimate of the channel response associated with each reference sample by low-pass filtering the stream of reference samples; and

(b) interpolating means, operatively coupled to the filtering means, for generating an estimated channel response between at least two of the reference sample estimated channel responses.

21. The communication unit of claim 11 wherein the detection means comprises means for generating the estimated data symbol from the stream of data samples by correlating the estimated channel response with the stream of data samples.

22. The communication unit of claim 11 wherein the detection means comprises means for generating an estimated data bit by utilizing maximum likelihood decoding techniques to derive the estimated data bit from the estimated data symbol.

23. The communication unit of claim 11 wherein the detection means comprises means for generating an estimated data bit by utilizing a Viterbi maximum likelihood decoding algorithm to derive the estimated data bit from the estimated data symbol.

24. The communication unit of claim 11 further comprising a receiving means, operatively coupled to the